

**PATENT ABSTRACTS OF JAPAN**

(11)Publication number : 09-124406

(43)Date of publication of application : 13.05.1997

(51)Int.Cl.

A01N 25/14  
A01N 25/08  
A01N 25/12  
A01N 33/02  
A01N 57/28  
// (A01N 57/28  
A01N 59:16  
A01N 59:20 )

(21)Application number : 07-287613

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(22)Date of filing : 06.11.1995

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MURAI JUNICHI**(54) GRANULATED WATER DISPERSIBLE POWDER**

(57)Abstract:

**PROBLEM TO BE SOLVED:** To produce a granulated water dispersible powder having character of suppressed evolution of powder dust, easy to measure as well as having a capability to contain an agrochemical in high concentration, and excellent in suspension stability and suppressed in phytotoxicity by adding specific metal oxides to an agrochemical as an active ingredient.

**SOLUTION:** One or more kinds of metal oxides selected from zinc oxide, aluminum oxide, titanium oxide, ferric oxide, copper oxide, nickel oxide and manganese oxide are added to an agrochemical as an active ingredient.

Acephate, Nitenpyram, Cartap hydrochloride, Validamycin A and Bensultap are preferred as the active ingredient.

The preferred content of the agrochemical as the active ingredient is more than 70wt.% based on total preparation. The preferred average particle size of metal oxide is about 0.01-15 $\mu$ m. Titanium oxide is especially preferred as the metal oxide. A surfactant and/or a binder may be added to this mixture. The granulated water dispersible powder having a bulk density of about 0.1-1.2g/ml is especially preferred.

**LEGAL STATUS**

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the  
examiner's decision of rejection or application converted  
registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of  
rejection][Date of requesting appeal against examiner's decision  
of rejection]

[Date of extinction of right]

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CLAIMS

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[Claim(s)]

[Claim 1] Granularity water dispersible powder which comes to contain one or more sorts of metallic oxides chosen from a group which consists of an agricultural-chemicals active ingredient and a zinc oxide, an aluminum oxide, titanium oxide, an iron oxide, copper oxide, nickel oxide, or manganese oxide.

[Claim 2] Granularity water dispersible powder according to claim 1 whose agricultural-chemicals active ingredient is acephate, nitenpyram, a cartap hydrochloride, validamycin A, a BENSURU tap, or ferimzone.

[Claim 3] Granularity water dispersible powder according to claim 1 or 2 whose content of an agricultural-chemicals active ingredient is about 70 % of the weight or more to the whole pharmaceutical preparation.

[Claim 4] Granularity water dispersible powder according to claim 1 to 3 whose mean particle diameter of a metallic oxide is about 0.01-15 micrometers.

[Claim 5] Granularity water dispersible powder according to claim 1 to 4 whose metallic oxide is titanium oxide.

[Claim 6] Granularity water dispersible powder according to claim 1 to 5 which furthermore contains a surfactant.

[Claim 7] Granularity water dispersible powder according to claim 6 an anionic detergent with which a surfactant uses dioctyl sulfo sodium succinate as a principal component, or whose HLB value is the nonionic surfactant of 9-13.

[Claim 8] Granularity water dispersible powder according to claim 1 to 7 which furthermore contains a binder.

[Claim 9] Granularity water dispersible powder according to claim 8 whose binder is a dextrin.

[Claim 10] Granularity water dispersible powder according to claim 1 to 9 which is the range whose bulk density is about 0.1-1.2g/ml.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the new granularity water dispersible powder suspended in water. The granulation water dispersible powder of this invention is excellent in respect of the simplicity of the ease of handling, the ease of measuring, dust prevention of drugs, and use etc., and very useful as an agricultural water firework composition.

[0002]

[Description of the Prior Art] An agricultural-chemicals active ingredient and granular water dispersible powder containing diatomaceous earth are \*\*\*\*\* (ed) by JP,6-128102,A. Moreover, although S and S' -[2-(dimethylamino) trimethylene] screw-benzene thio sulfonate, a titanium dioxide, a calcium oxide, a zinc oxide, a magnesium oxide, and the stable solid preparations of boron oxide that contain a kind at least are indicated by JP,64-4,A, there is no publication about granularity water dispersible powder in it.

[0003]

[Problem(s) to be Solved by the Invention] Since the dusting at the time of measuring of drugs and preparation of a drug solution etc. posed a problem since the conventional water dispersible powder is powdered, and a fluidity was missing, there was a defect of being hard to measure. About liquids and solutions, the agricultural-chemicals active ingredient which is easy to decompose in the condition of having melted into water had the defect of being inapplicable. Moreover, since it was a liquid, it needed to put into solid containers, such as a glass bottle and a plastics bottle, and failure of a container arose and there were problems, like a large storage area is needed. Furthermore, the present condition is that is not desirable to environment, such as a problem of disposal of a used container. In order to consider as the pharmaceutical preparation without dusting which is easy to measure from a viewpoint of operator protection, it is the problem of the max [ disposal / a container ] in liquids and solutions with it difficult [ to solve these troubles in the conventional powdered water dispersible powder ] and. Thus, there was little dusting, it was easy to carry out measuring, and development of granularity water dispersible powder convenient also for storage and storage was desired.

[0004]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, as a result of repeating research wholeheartedly, by blending a zinc oxide, an aluminum oxide, titanium oxide, or an iron oxide with an agricultural-chemicals active ingredient, this invention person had little dusting and did the knowledge of it being not only easy to carry out measuring, but being able to contain an agricultural-chemicals active ingredient by high concentration, excelling in a suspensibility, and granularity water dispersible powder with little phytotoxicity being obtained. Furthermore, this invention persons came to complete this invention, as a result of performing research examination further based on these knowledge.

[0005] This invention Namely, (1) agricultural-chemicals active ingredient and a zinc oxide, an aluminum oxide, Granularity water dispersible powder which comes to contain one or more sorts of metallic oxides chosen from a group which consists of titanium oxide, an iron oxide, copper oxide, nickel oxide, or manganese oxide, (2) An agricultural-chemicals active ingredient Acephate, nitenpyram, a cartap hydrochloride, Granularity water dispersible powder given in \*\* (1) term which is validamycin A, a BENSURU tap, or ferimzone, (3) A \*\* (1) term whose content of an agricultural-chemicals active ingredient is about 70 % of the weight or more to the whole pharmaceutical preparation, or granularity water dispersible powder given in \*\* (2) term, (4) Mean particle diameter of a metallic oxide Granularity water dispersible powder given in about 0.01 \*\* (1) term - \*\* (3) term which is 15 micrometers, (5) Granularity water dispersible powder a \*\* (1) term whose metallic oxide is titanium oxide - given in \*\* (4) term, (6) Granularity water

dispersible powder a \*\* (1) term which contains a surfactant further - given in \*\* (5) term, (7) Granularity water dispersible powder given in \*\* (6) term an anionic detergent with which a surfactant uses dioctyl sulfo sodium succinate as a principal component, or a given HLB value is the nonionic surfactant of 9-13, (8) Granularity water dispersible powder a \*\* (1) term which contains a binder further - given in \*\* (7) term, (9) Granularity water dispersible powder given in \*\* (8) term a given binder is a dextrin, and (10) bulk density of granularity water dispersible powder given in about 0.1 \*\* (1) term - \*\* (9) term which is the range which is 1.2g/ml. In addition, TM used in this detail means a registered trademark.

[0006] In granularity water dispersible powder of this invention, as an agricultural-chemicals active ingredient, if it is a solid-state in ordinary temperature, an insecticide, a germicide, a herbicide, etc. may be which agricultural-chemicals active ingredients, and one sort or two sorts or more of agricultural-chemicals active ingredients can be used. It is as follows when an example of an agricultural-chemicals active ingredient applicable to this is given.

a [insecticide] -- pyridaphenthion, dimethoate, PMP, CVMP, dimethylvinphos, acephate, SARICHION, DEP and NAC, MTMC, MIPC, PHC, MPMC, XMC, and a vendor -- Io -- KARUBU, pilus MIKARUBU, a meso mill, oxamyl, thio JIKARUBU, SHIPERUME thorin, a cartap hydrochloride, thiocyclam, a BENSURU tap, JIFURUBENZURON, teflubenzuron, KURORU fluazuron, buprofezin, HEKISHICHIAZOKUSU, fenbutatin oxide, pyridaben, clofentezine, nitenpyram, etc.

[Germicide] Ziram, thiuram, captan, TPN, fthalide, torque ROHOSU methyl, HOSECHIRU, thiophanate-methyl, BENOMIRU, cull vendor ZORU, thiabendazole, JIETOFENKARUBU, iprodione, vincrozone, procymidone, Fluor imide, oxycarboxin, MEPUONIRU, flutolanil, The Benxi kuron, metalaxyl, oxadixyl, thoria JIMEHON, hexa kona ZORU, Trifolin, blasticidin S, kasugamycin, polyoxin, Validamycin A, mill DIO mycin, PCNB, hydroxyisoxazole, dazomet, dimethirimol, dichlomedin, triazine, ferimzone, Probenazole, isoprothiolane, tricyclazole, pyroquilon, oxolinic acid, etc.

[0007] [Herbicide] MCP, MCPB, triclopyr, naproanilide, CNP, Chlormethoxynil, bifenox, MCC, pilus BUCHIKARUBU, DCPA, Bromobutide, a MEFENA set, NAPUROBAMIDO, diphenamid, propyzamide, Asulam, DCMU, linuron, dymron, methyl dimuron, TEBUCHUURON, bensulfuron-methyl, simazine, Atrazine, simetryn, Ametryn, prometryn, dimethametryn, metribuzin, bentazone, Oxadiazon, pyrazolate, benzo FENAPPU, pro diamine, glyphosate, beer RAHOSU, Alloxym, imazosulfuron, horse mackerel MUSURU chlorofluorocarbon, PIRAZOSU Le FROMT ethyl, SHINOSURUFU chlorofluorocarbon, etc.

In addition, if it is a solid-state-like agricultural-chemicals active ingredient in ordinary temperature, it will not be limited to these. Also in the above-mentioned agricultural-chemicals active ingredient, acephate, nitenpyram, a cartap hydrochloride, a BENSURU tap, ferimzone, etc. are desirable, and especially acephate is suitable, for example.

[0008] In granularity water dispersible powder of this invention, one sort or two sorts or more of things chosen from a zinc oxide, an aluminum oxide, titanium oxide, an iron oxide, copper oxide, nickel oxide, manganese oxide, etc. are used as a metallic oxide. Also in these metallic oxides, a zinc oxide, an aluminum oxide, titanium oxide, an iron oxide, etc. are desirable, and titanium oxide etc. is especially suitable, for example. Mean particle diameter is about 0.01-15 micrometers usually moreover, more preferably desirable [ an about 1-10-micrometer thing etc. ] as these metallic oxides about 0.1-15 micrometers preferably, for example.

[0009] In addition to this, an additive used for the usual granulation water dispersible powder can be used for granularity water dispersible powder of this invention. For example, what is necessary is to be able to use freely a surfactant, a binder, a stabilizing agent, a coloring agent, antiseptics, support, etc., and just to choose these according to a class of agricultural-chemicals active ingredient used. As a surfactant, which surfactants, such as the usual nonionic surfactant, a cationic surfactant, and an anionic detergent, can be used, and these one sort or two kinds or more may be used. As a nonionic surfactant, a block copolymerization object of polyoxyethylene alkyl ether, polyoxyethylene alkyl phenyl ether, the polyoxyethylene polyoxypropylene ether, polyoxyethylene alkyl ester, a sorbitan fatty acid ester, polyoxyethylene sorbitan fatty acid ester, ethyleneoxide, and propylene oxide, higher-fatty-acid alkanol AMAIDO, etc. are used, for example. As a cationic surfactant, an alkylamine salt, quarternary ammonium salt, etc. are used, for example.

[0010] As an anionic detergent, for example A naphthalene sulfonic-acid polycondensation object metal salt, A formalin condensate of an alkenyl sulfonate and a naphthalene sulfonate, Alkyl naphthalenesulfonate, a ligninsulfonic acid salt, an alkyl allyl compound sulfonate, Macromolecule system compounds, such as an alkyl allyl compound sulfonate sulfate, a polystyrene sulfonate Na salt, A polycarboxylic acid Na salt, polyoxyethylene styrene-ized diphenyl ether ammonium sulfate, a higher-alcohol sulfonate, a higher-alcohol ether sulfonate, dialkyl sulfosuccinate, a higher-fatty-acid alkali-metal salt, etc. are used. As a surfactant used by this invention, an anionic detergent and a nonionic surfactant are desirable also in the above. Especially as a nonionic surfactant, a thing of the range of 9-13 has a

desirable HLB value, in view of solubility and a point of a humid operation over water. Moreover, as an anionic detergent, a surfactant which uses dioctyl sulfo sodium succinate as a principal component is desirable. More specifically as an anionic surfactant, new cull gene EP-70GTM (product made from Takemoto Fats and oils) which uses dioctyl sulfo sodium succinate as a principal component, Neocol SW-coal tar mixture (Dai-Ichi Kogyo Seiyaku Co., Ltd. make), Sun Morin OT-70TM (Mitsuhiro formation Make), etc. are used. an HLB value is used for polyoxyethylene alkyl phenyl ether (an example, product made from polyoxyethylene nonylphenyl [NP-85 Ether TM] Takemoto Fats and oils), a block copolymerization object (an example, new pole PE-64TM, and Mitsuhiro -- Formation -- make) of ethyleneoxide and propylene oxide, etc. as a nonionic surfactant of 9-12, for example.

[0011] As a binder, a water-soluble binder etc. is used preferably. As such a water-soluble binder, for example, a dextrin, polyvinyl alcohol, gum arabic, sodium alginate, a polyvinyl pyrrolidone, a glucose, a sucrose, etc. are used, and a dextrin etc. is especially desirable. By making these water-soluble binders contain, granularity water dispersible powder of this invention can raise granulation reinforcement, without spoiling decay dispersibility over water further. As a stabilizing agent, a phosphoric acid, a PAP (isopropyl acid phosphate) assistant, etc. are used, for example. As a coloring agent, the cyanine green G, the ERIO green B400, etc. are used, for example. As antiseptics, sorbic-acid potash etc. is used, for example. As support, montmorillonite system clay minerals (an example, a montmorillonite, beidellite, nontronite, saponite, hectorite, SAUKO night, etc.), activated carbon, vegetable powder (an example, a soybean meal, tobacco powder, wheat flour, wood flour, etc.), clay, talc, mica powder (an example, talcum powder, agalmatolite powder, etc.), a lactose, sodium bicarbonate, a calcium carbonate, an alumina, sulfur powder, etc. can be used, for example.

[0012] A content of an agricultural-chemicals active ingredient in granularity water dispersible powder of this invention is about 95 - 99 % of the weight still more preferably about 75 to 99% of the weight more preferably about 50 to 99% of the weight usually preferably [ about one to 99% of the weight ] to the whole pharmaceutical preparation. A metallic oxide is about 0.1 - 95 % of the weight usually preferably used still more preferably about 0.1 to 50% of the weight to the whole pharmaceutical preparation in about 1 - 20% of the weight of the range. A surfactant is usually preferably used in 0 - 5% of the weight of the range zero to 10% of the weight to the whole pharmaceutical preparation. A binder is usually preferably used in 0 - 10% of the weight of the range zero to 20% of the weight to the whole pharmaceutical preparation. Support is usually preferably used in 0 - 50% of the weight of the range zero to 90% of the weight to the whole pharmaceutical preparation. In addition, additives, such as a stabilizing agent, a coloring agent, and antiseptics, are usually used in 0 - 10% of the weight of the range to the whole pharmaceutical preparation.

[0013] Moreover, in granularity water dispersible powder of this invention, oxidation silicon can also be used as a metallic oxide. It is desirable to use support which uses oxidation silicon as a principal component especially. A radio light, a pearlite, cerite, white carbon, etc. are used, and, specifically, a radio light etc. is especially suitable. Mean particle diameter of oxidation silicon usually has a desirable thing of the range of about 0.1-15 micrometers. When using oxidation silicon as a metallic oxide, in granularity water dispersible powder of this invention, an agricultural-chemicals active ingredient is usually preferably used about 95 to 99% of the weight about 75 to 99% of the weight to the whole pharmaceutical preparation. What was mentioned above, and same thing can be used as other additives. Oxidation silicon is about 0.1 - 25 % of the weight usually preferably used still more preferably about 0.1 to 5% of the weight to the whole pharmaceutical preparation in about 1 - 5% of the weight of the range. A surfactant is usually preferably used in 0 - 5% of the weight of the range zero to 10% of the weight to the whole pharmaceutical preparation. A binder is usually preferably used in 0 - 10% of the weight of the range zero to 20% of the weight to the whole pharmaceutical preparation. Support is usually preferably used in 0 - 10% of the weight of the range zero to 20% of the weight to the whole pharmaceutical preparation. In addition, additives, such as a stabilizing agent, a coloring agent, and antiseptics, are usually used in 0 - 10% of the weight of the range to the whole pharmaceutical preparation.

[0014]

[Embodiment of the Invention] The granularity water dispersible powder of this invention can be manufactured by the wet piston granulation method or dry granulation used for manufacture of the usual granularity water dispersible powder. Among these, what is depended on wet granulation can usually be manufactured by usually carrying out piston granulation using the water of the about one to 10 weight section to the pharmaceutical preparation solid content of the 100 weight sections. In the case of dry granulation, it can manufacture only by consolidation, without using water. Specifically, in the case of wet granulation, a surfactant, a binder, etc. are mixed to homogeneity with a kneading machine etc. an agricultural-chemicals active ingredient, a metallic oxide, and if needed. For example, a formed element is moderately mixed among the components blended, a liquid component is dropped there, and mixing is continued further. Moreover, in this case, case [ whose formed element is / like a lump ], it is desirable to grind to moderate powder and to make mixed actuation easy by coarse grinding etc. As a particle of moderate powder, it is

about 1-100 micrometers in particle diameter. Subsequently, the water of optimum dose is added to this mixture, and it scours with a kneading machine further. A kneaded object produces smooth stickiness and this kneading performs it to the degree suitable for the piston granulation of an after production process. And this kneaded object is granulated by the usual wet pellet mill.

[0015] On the other hand, in the case of dry granulation, an agricultural-chemicals active ingredient and a metallic oxide are mixed to homogeneity with a mixer. What was mixed is granulated with a dry type granulating machine. Although underwater collapsibility and underwater dispersibility are inferior as compared with what is depended on wet granulation, what is depended on dry granulation does not need a surfactant and a binder, and has the advantage that there are not kneading and a desiccation production process. As occasion demands, the particle size regulation of the granulation object is carried out, and a desired hydration granule is obtained. A particle size regulation is performed in the range in which an opening does not pass 300 micrometers but passes 1700 micrometers. The obtained granulation has the desirable thing of the range the major axis of whose is about 0.5-5.0mm. Thus, as bulk density of the granularity water dispersible powder of this invention obtained, it is desirable that it is usually the range of about 0.1-1.2g/ml, and the range which is about 0.5-1.0g/ml is especially desirable. Although the amount of the granularity water dispersible powder used of this invention changes with the class of agricultural-chemicals active ingredient contained, contents, etc., it is usually about 200-4000g preferably about 100-5000g per 10a. The well-known method generally used for crop dusting can be used for operation. for example, the granularity water dispersible powder of this invention -- the indifferent water -- business -- the time -- dissolution dilution -- it is used by carrying out. For example, it is desirable to dilute and use for about (about 1g / 100ml - 1g / 20000ml) about 100 to 20000 times. As for the granularity water dispersible powder of this invention, saving in a dampproof container etc. is desirable in order to avoid moisture. As such a container, the bag of the product made from a plastics bottle, a polyethylene bottle, a polyethylene lamination aluminum foil package, and polyethylene for example, etc. is simple.

[0016]

[Example] Although the example of reference, an example, and the example of a trial are shown below and this invention is further explained to it at details, the range of this invention is not limited to these. In addition, especially % and the section that are used in here show weight % and the weight section altogether, as long as it is unstated.

[0017]

[The example 1 of reference] It kneaded until it added the water of the six sections to the pharmaceutical preparation solid content of the 100 weight sections and produced smooth stickiness under the room temperature with the kneading machine (the Kikusui factory, KM-1.5), after mixing enough surfactant new cull gene EP-70G of the acephate of the manufacture 95 section of the hydration granulation A containing acephate 95%, and the 1.0 sections, the dextrin of the 1.0 sections, and the oxidation silicon (a radio light, mean particle diameter, 6.2 micrometers) of the three sections. The kneaded object was corned into cylinder-like granulation in the pellet mill (the Kikusui factory, RG-5M) using the screen of the diameter of 0.8mm. The obtained granulation is dried at 60 degrees C for 1 hour, and it is acephate. The hydration granulation A containing 95% was obtained.

[0018]

[The example 2 of reference] After mixing enough the acephate of the manufacture 95 section of the hydration granulation B containing acephate 95%, and the oxidation silicon (a radio light, mean particle diameter, 6.2 micrometers) of the five sections, the hydration granulation B which adds the water of the eight sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains acephate 95% in the same procedure as the example 1 of reference below was obtained.

[0019]

[The example 3 of reference] After mixing enough the acephate of the manufacture 98 section of the hydration granulation C containing acephate 98%, and the oxidation silicon (cerite, mean particle diameter, 4 micrometers) of the two sections, the hydration granulation C which adds the water of the four sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains acephate 98% in the same procedure as the example 1 of reference below was obtained.

[0020]

[The example 4 of reference] After mixing enough surfactant new cull gene EP-70G of the acephate of the manufacture 75 section of the hydration granulation D containing acephate 75%, the dextrin of the five sections, and the one section, and the oxidation silicon (a radio light, mean particle diameter, 6.2 micrometers) of the 19 sections, the hydration granulation D which adds the water of the eight sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains acephate 75% in the same procedure as the example 1 of reference below was obtained.

[0021]



[The example 5 of reference] After mixing enough the acephate of the manufacture 95 section of the hydration granulatio E containing acephate 95%, the oxidation silicon (white carbon, mean particle diameter, 4.8 micrometers) of the two sections, and the clay for water dispersible powder of the three sections, it corned with the dry type granulating machine (turbo industry WP-160x60), and the hydration granulatio E containing acephate 95% was obtained.

[0022]

[The example 6 of reference] After mixing the clay for water dispersible powder of the acephate of the manufacture 50 section of the powdered water dispersible powder A containing acephate 50%, the surfactant disk ZORU W-K3 section, and the 47 sections, the powdered water dispersible powder A which pulverizes and contains acephate 50% was obtained.

[0023]

[The example 7 of reference] After mixing the clay for water dispersible powder of the acephate of the manufacture 75 section of the powdered water dispersible powder B containing acephate 75%, the surfactant disk ZORU W-K3 section, and the 22 sections, the powdered water dispersible powder B which pulverizes and contains acephate 75% was obtained.

[0024]

[Example 1] After mixing enough the acephate of the manufacture 95 section of the hydration granulatio F containing acephate 95%, and the titanium oxide of the five sections, the hydration granulatio F which adds the water of the eight sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains acephate 95% in the same procedure as the example 1 of reference below was obtained.

[0025]

[Example 2] After mixing enough the acephate of the manufacture 95 section of the hydration granulatio G containing acephate 95%, and the aluminum oxide of the five sections, the water of the eight sections is added to the pharmaceutical preparation solid content of the 100 weight sections, and it is acephate by the same procedure as the example 1 of reference below. The hydration granulatio G containing 95% was obtained.

[0026]

[Example 3] After mixing enough the aluminum oxide of surfactant new pole PE-64 of the BENSURU tap of the manufacture 75 section of the hydration granulatio H containing BENSURU tap 75%, the dextrin of the five sections, and the one section, and the five sections, and the titanium oxide of the 14 sections, the hydration granulatio H which adds the water of the ten sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains BENSURU tap 75% in the same procedure as the example 1 of reference below was obtained.

[0027]

[Example 4] After mixing enough the titanium oxide of the surfactant NP-85 of the ferimzone of the manufacture 75 section of the hydration granulatio I containing ferimzone 75%, the dextrin of the five sections, and the one section, and 5 section, and the zinc oxide of the 14 sections, the hydration granulatio I which adds the water of the ten sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains ferimzone 75% in the same procedure as the example 1 of reference below was obtained.

[0028]

[Example 5] After mixing enough surfactant new cull gene EP-70G of the acephate of the manufacture 95 section of the hydration granulatio J containing acephate 95%, and the 0.5 sections, the dextrin of the 1.0 sections, and the iron oxide of the 3.5 sections, the hydration granulatio J which adds the water of the five sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains acephate 95% in the same procedure as the example 1 of reference below was obtained.

[0029]

[Example 6] After mixing enough surfactant NP-85 of the cartap hydrochloride of the manufacture 95 section of the hydration granulatio K containing 95% of cartap hydrochlorides, and the one section, and the zinc oxide of the four sections, the water of the six sections is added to the pharmaceutical preparation solid content of the 100 weight sections, and it is a cartap hydrochloride by the same procedure as the example 1 of reference below. The hydration granulatio K containing 95% was obtained.

[0030]

[Example 7] After mixing enough surfactant new pole PE-64 of the nitenpyram of the manufacture 95 section of the hydration granulatio L containing nitenpyram 95%, and the 0.5 sections, and the zinc oxide of the 4.5 sections, the hydration granulatio L which adds the water of the seven sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains nitenpyram 95% in the same procedure as the example 1 of reference below was obtained.

[0031]

[Example 8] After mixing enough surfactant new pole PE-64 of the acephate of the manufacture 95 section of the hydration granulatio M containing acephate 95%, and the 0.5 sections, and the titanium oxide of the 4.5 sections, the hydration granulatio M which adds the water of the seven sections to the pharmaceutical preparation solid content of the 100 weight sections, and contains acephate 95% in the same procedure as the example 1 of reference below was obtained.

[0032]

[The example 1 of a trial] 500ml water is put into the cylinder of 500ml of underwater collapsibility, and it adds so that active principle concentration may be set to 500 ppm in a sample at this. The following three-stage estimated collapsibility.

A: The thing B to which 1/2 or more [ of pharmaceutical preparation ] collapsed by the time it reached the pars basilaris ossis occipitalis : or more for 1/2, pharmaceutical preparation is a non-collapsed thing by the time it reaches a pars basilaris ossis occipitalis. [0033]

[The example 2 of a trial] 500ml water is put into a cylinder with an underwater dispersibility of 500ml, and it adds so that active principle concentration may be set to 500 ppm in a sample at this. The count of a fall taken to check the existence of distribution of a sample and to become a primary particle whenever it carries out the fall (180 degree x2) of the cylinder once was measured.

[0034]

[The example 3 of a trial] 20g of dust dustability samples was paid to the 1l. mayonnaise bottle, after covering and shaking violently several times, it put, and the time amount considered that black paper was made into the background and the suspended particle almost sedimented was measured by macro-scopic observation. The result of the above-mentioned examples 1-3 of a trial is shown in a table 1.

[0035]

[A table 1]

試料名	試験例 1 水中崩壊性	試験例 2 水中分散性	試験例 3 粉塵飛散性
顆粒 A	A	0回	5秒以内
顆粒 B	A	1回	同上
顆粒 C	A	0回	同上
顆粒 F	A	1回	同上
顆粒 G	A	1回	同上
顆粒 J	A	1回	同上
顆粒 K	A	1回	同上
顆粒 L	A	0回	同上
顆粒 M	A	1回	同上
粉末 A	—	2回	3 5秒
粉末 B	—	2回	2 8秒

As for a table 1, the granularity water dispersible powder of this invention is excellent in underwater collapsibility and underwater dispersibility, and that it is few also showed dust dustability.

[0036]

[Effect of the Invention] The granularity water dispersible powder of this invention suppresses generating of the dust at the time of handling, it is not only easy to measure it, but it is excellent in a suspensibility, and it has the feature that little phytotoxicity is. Moreover, it is the simple pharmaceutical preparation of use which collapses and distributes easily and replaces water at conventional hydration powders and liquids and solutions.

[Translation done.]